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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/974,637	10/09/2001	Ashok K. Agarwal	72162-243315	9924

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EXAMINER

MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/974,637	Applicant(s) AGARWAL, ASHOK K.	
	Examiner Krishnan S Menon	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 15-20 are objected to because of the following informalities: Instant Claims read as method claims in the preamble, but depend from claim 12, which is a product claim. Examiner believes that this is a typographical error, and should read 'filtration membrane' in place of 'method'. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chau et al (US 4,983,291).

Chau teaches a filtration membrane as in the instant claims as follows:

Claim 12: A filtration membrane for separating a contaminant from a feed fluid to produce a product fluid, said membrane comprising:

a porous substrate having a first surface and a product permeable-permeable layer cast on said first surface of said porous substrate, said layer comprising the interfacial polymerization reaction product of an aqueous amine solution and an acyl halide solution (abstract; col 3 line 5-col 4 line 25),

wherein said aqueous amine solution includes an amine, propionic acid and a non-amine base, and said acyl halide solution includes an acyl halide and an organic solvent (product by process:

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the contents of the solutions for the reaction do not form part of the membrane structure. “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).)

Claim 13: The filtration membrane according to claim 12, wherein said layer has pores of a size suitable for nanofiltration (inherent: membranes made from piperazine forms nano-filtration membrane – specification page 5 line 1; Chau teaches using piperazine in col 5 line 26; similar composition. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. “There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102.” In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.)

Claim 14: The filtration membrane according to claim 12, wherein said layer has pores of a size suitable for reverse osmosis filtration (examples).

Claim 15: The filtration membrane according to claim 12, wherein said amine is one of piperazine and m-poly(phenylenediamine) (col 5 line 26-35).

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Claim 16: The filtration membrane according to claim 12, wherein said non-amine base is sodium hydroxide (col 5 lines 45-49).

Claim 17: The filtration membrane according to claim 12, wherein said aqueous amine solution is prepared by dissolving said amine and a propionate salt in water (product by process - In re Thorpe).

Claim 18: The filtration membrane according to claim 12, wherein said acyl halide is trimesoyl chloride (col 5 lines 50-67).

Claim 19: The filtration membrane according to claim 12, wherein said organic solvent is immiscible in water (product by process - In re Thorpe).

Claim 20: The filtration membrane according to claim 19, wherein said organic solvent is naphtha (product by process - in re Thorpe).

Claim 21: The filtration membrane according to claim 12, wherein said porous substrate is comprised of polysulfone (col 5 line 16).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chau et al (US 4,983,291) in view of Koo et al (US 6,245,234 B1).

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Chau et al teaches the elements of claim 1 as follows: A method for producing a filtration membrane, the method comprising (abstract, col 3 line 5 – col 6 line 15):

applying an aqueous amine solution to a surface of said porous substrate (col 5 lines 20-25), said aqueous amine solution including an amine (col 5 lines 25-35), propionic acid and a non-amine base (col 5 lines 45-49)

applying an acyl halide solution to be in contact with said aqueous amine solution along an interface' said acyl halide solution including an acyl halide and an organic solvent(col 5 line 50-col 6 line 14); and

causing polymerization to occur at said interface.

Chau does not teach using propionic acid in the amine solution. Koo teaches use of propionic acid in the amine solution (col 7 lines 3-11) in the process of making a high-flux semipermeable membrane using a multifunctional amine and a multifunctional acid chloride. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Koo in the teaching of Chau for improved flux and salt rejection in low pressure applications (Koo col 4 lines 6-11).

Claims 2-11 have further added limitations which are taught by Chau as follows:

Claim 2: The method according to claim 1, wherein applying said aqueous amine solution includes wetting a portion of said porous substrate with said aqueous amine solution (col 5 lines 20-25).

Claim 3: The method according to claim 1, wherein said aqueous amine solution is applied in a layer having a first surface in contact with said substrate and a second surface, and further wherein said acyl halide solution is applied to be in contact with said second surface to form said interface (col 5 lines 50-67).

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Claim 4: The method according to claim 1, wherein said amine is one of piperazine and m-poly(phenylenediamine) (col 5 lines 25-35).

Claim 5: The method according to claim 1, wherein said non-amine base is sodium hydroxide (col 5 lines 45-49).

Claim 6: The method according to claim 1, further including preparing said aqueous amine solution from said amine and a propionate salt (see Koo as in claim 1).

Claim 7: The method according to claim 1, wherein said acyl halide is trimesoyl chloride (col 5 lines 60-62).

Claim 8: The method according to claim 1, wherein said organic solvent is immiscible in water (col 6 lines 10-14).

Claim 9: The method according to claim 8, wherein said organic solvent is naphtha (col 6 line 12).

Claim 10: The method according to claim 1, wherein said porous substrate is comprised of polysulfone (col 5 lines 13-19).

Claim 11: The method according to claim 1, further including drying said membrane after said polymerization has occurred. (col 7 lines 22-27)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner

Walker
W. L. WALKER
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